

NAME:

DATE:

Unit-2 Mastery Assessment (version 620)

Question 1 (10 points)

Let f represent a function. If $f[12] = 9$, then there exists a knowable solution to the equation below.

$$y = 3 \cdot \left(f\left[\frac{x}{2} - 11\right] + 5 \right)$$

Find the solution.

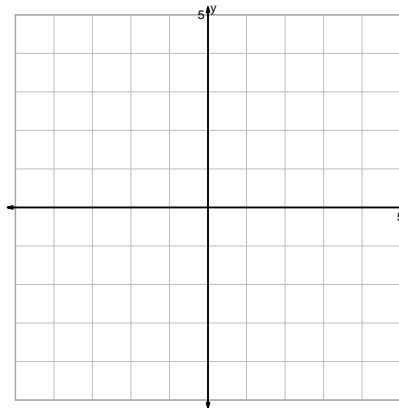
$$x =$$

$$y =$$

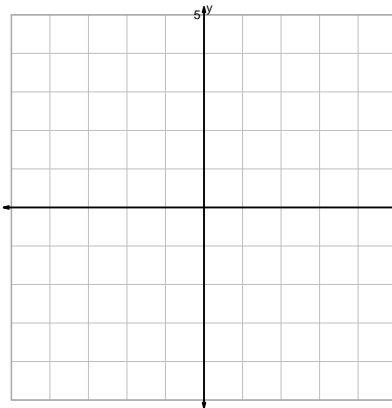
Question 2 (20 points)

Graph the equations accurately. For each integer-integer point on the parent, indicate the corresponding point precisely. Also, with dashed lines, indicate any asymptotes.

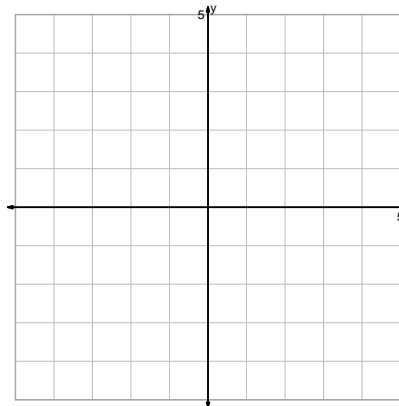
$$y = 2 \cdot 2^x$$



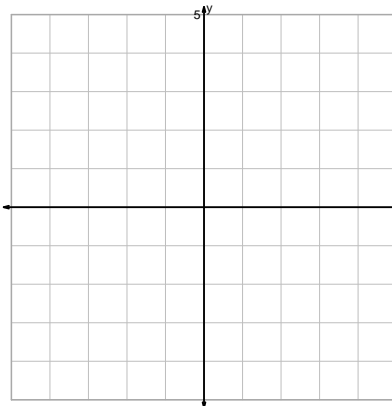
$$y = \sqrt{\frac{x}{2}}$$



$$y = -\sqrt{x}$$

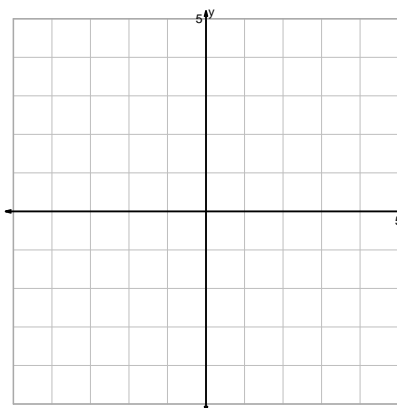


$$y = \sqrt[3]{x+2}$$

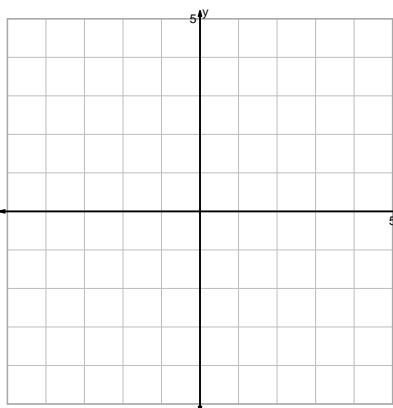


Question 2 continued...

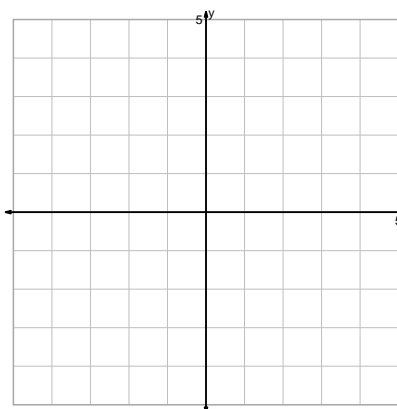
$$y = \frac{x^2}{2}$$



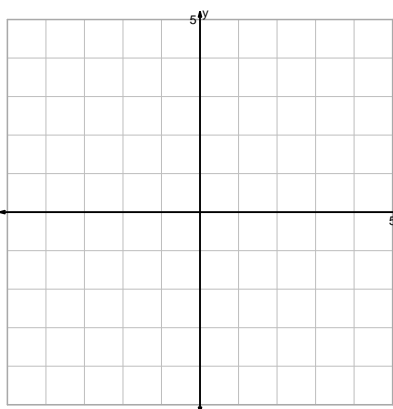
$$y = 2^{-x}$$



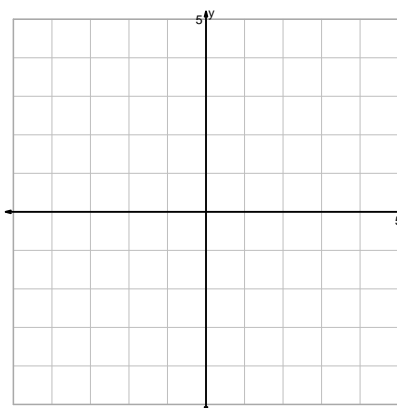
$$y = \log_2(2x)$$



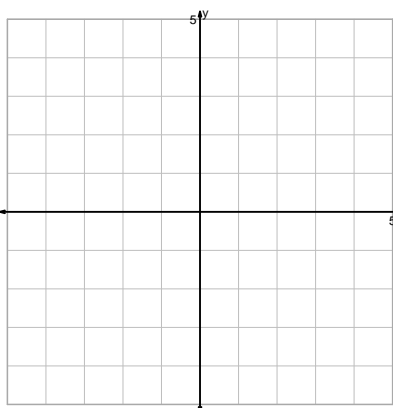
$$y = x^2 - 2$$



$$y = (x - 2)^3$$

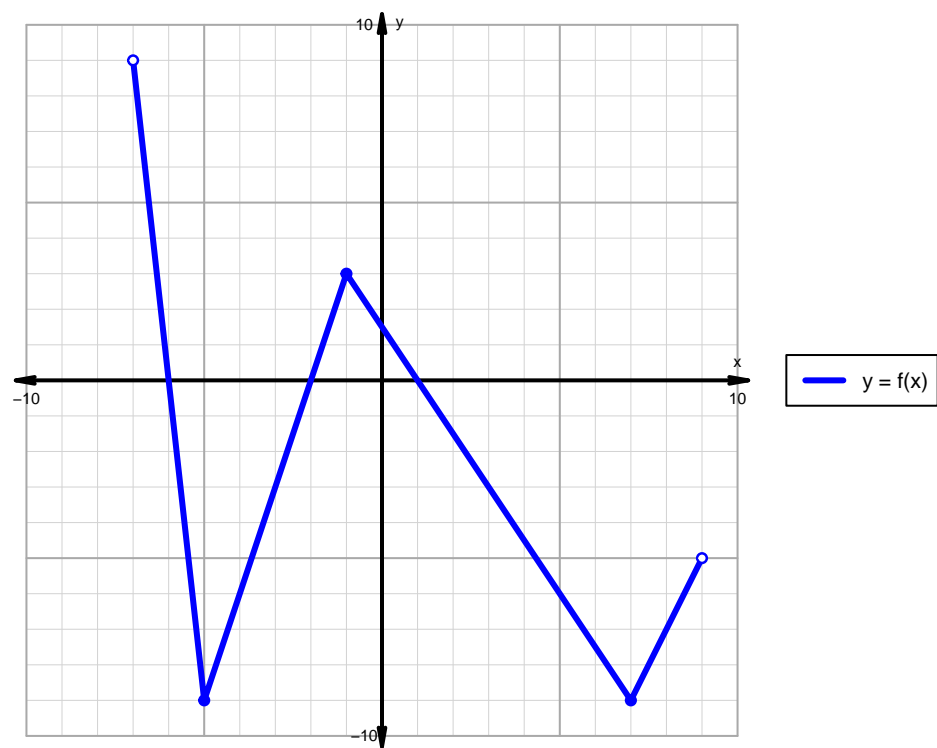


$$y = x^3 + 2$$



Question 3 (20 points)

A function is graphed below.



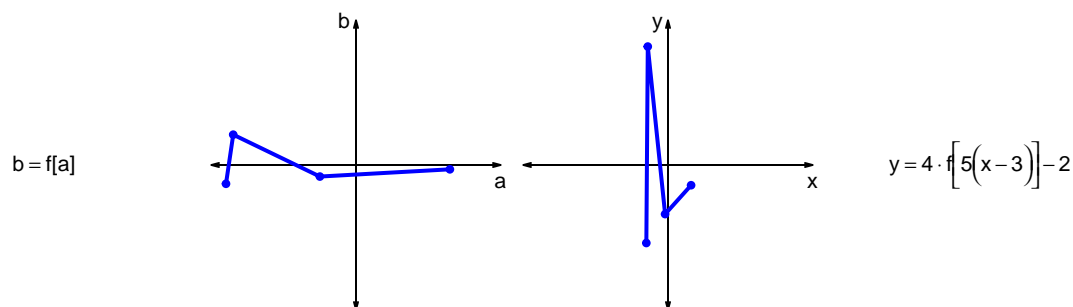
Indicate the following intervals using interval notation.

Feature	Where
Positive	
Negative	
Increasing	
Decreasing	
Domain	
Range	

Question 4 (20 points)

Let f represent a function. The curves $b = f[a]$ and $y = 4 \cdot f[5(x - 3)] - 2$ are represented below in a table and on graphs.

a	b	x	y
-90	-13	-15	-54
-85	21	-14	82
-25	-8	-2	-34
65	-3	16	-14



- Write formulas for calculating x from a and calculating y from b . (Or, write the coordinate transformation formula.)
- What geometric transformations (using words like translation, stretch, and shrink), and in what order, would transform the first curve $y = f[x]$ into the second curve $y = 4 \cdot f[5(x - 3)] - 2$?

Question 5 (10 points)

A parent square-root function is transformed in the following ways:

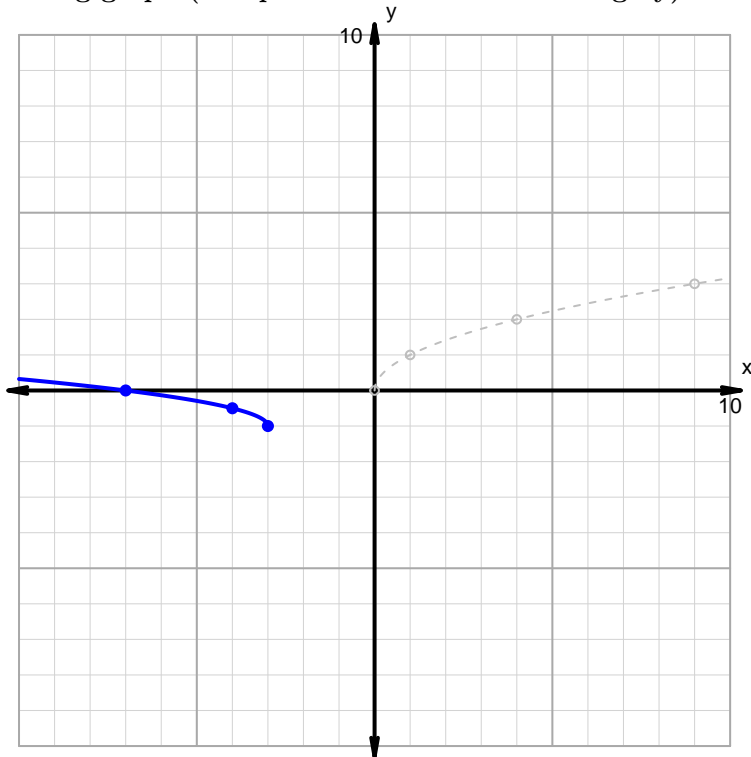
Horizontal transformations

1. Translate right by distance 3.
2. Horizontal reflection over y axis.

Vertical transformations

1. Vertical shrink by factor 2.
2. Translate down by distance 1.

Resulting graph (and parent function in dashed grey):



- What is the equation for the curve shown above?

Question 6 (20 points)

Make an accurate graph, and describe locations of features.

$$y = \frac{1}{2} \cdot |x + 3| - 2$$



Feature	Where
Domain	
Range	
Positive	
Negative	
Increasing	
Decreasing	